



## OFFICE OF RIVER PROTECTION

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

DEC 02 2016

16-TF-0132

Ms. Alexandra K. Smith, Program Manager  
Nuclear Waste Program  
Washington State  
Department of Ecology  
3100 Port of Benton Blvd.  
Richland, Washington 99354

Ms. Smith:

### CLARIFICATION OF THE IMPACT ANALYSIS RELATED TO STOP WORK ORDER ISSUED ON JULY 11, 2016

- References:
1. Ecology letter from A.K. Smith to K.W. Smith, ORP, Assessment of Potential Impacts on Tank Waste Retrievals due to Labor Concerns about Vapors, 16-NWP-176, dated October 16, 2016
  2. ORP letter from K.W. Smith to A.K. Smith, Ecology, "Status Update Related to Tank Farm Vapors," 16-TF-0102, dated September 15, 2016.
  3. ORP letter from W.E. Hader to K.A. Downing, WRPS, Contract No. DE-AC27-08RV14800, Clarification of Washington River Protection Solutions LLC Response to Impact Analysis Related to Stop Work Order Issued on July 11, 2016, 16-TF-0101

This letter responds to Ecology's October 17, 2016 letter (Reference 1) and your request for a copy of the Washington River Protection Solutions, LLC (WRPS) response to the U.S. Department of Energy (DOE) Office of River Protection's (ORP) September 8, 2016 request for additional information (Reference 3). Although the WRPS response was originally due on October 5, 2016 (Reference 2), due to the complicated analysis involved, ORP extended this date and WRPS submitted its response to Reference 3 on November 22, 2016. Attached please find a copy of the WRPS response.

We are evaluating the analysis in the WRPS response letter, and we concluded it was most appropriate to provide the letter to you promptly. We are also continuing to evaluate the impact of the Hanford Atomic Metal Trades Council demand letter, the Stop Work Order, and the associated Memorandum of Agreement and will keep Ecology informed of further developments in our understanding. ORP will be available to meet with you as soon as possible if you would like me to take you through the details of the attached letter. In the event that DOE determines

Alexandra K. Smith  
16-TF-0132

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a serious risk has arisen that DOE may be unable to meet any milestones established in the Amended Consent Decree, DOE will timely notify Ecology in accordance with the Amended Consent Decree.

If you have any questions, please contact Glyn Trenchard, Deputy Assistant Manager for Tank Farm Project, at (509) 373-4016.



Kevin W. Smith  
Manager

TF:LMG

Attachment

cc w/attach:

R.S. Skeen, CTUIR

J.J. Lyon, Ecology

D.A. Faulk, EPA

S. Hudson, HAB

G. Bohnee, NPT

K. Niles, ODOE

R. Buck, Wanapum

R. Jim, YN

D. Rowland, YN

TPA Administrative Record

Environmental Portal

Attachment

16-TF-0132

CLARIFICATION OF THE IMPACT ANALYSIS RELATED TO  
STOP WORK ORDER ISSUED ON JULY 11, 2016



November 22, 2016

WRPS-1603818 R1

Mr. W. E. Hader, Contracting Officer  
U.S. Department of Energy  
Office of River Protection  
Post Office Box 450  
Richland, Washington 99352-0450

Dear Mr. Hader:

CONTRACT NUMBER DE-AC27-08RV14800 – WASHINGTON RIVER PROTECTION SOLUTIONS LLC RESPONSE TO REQUEST FOR CLARIFICATION OF THE IMPACT ANALYSIS RELATED TO STOP WORK ORDER ISSUED ON JULY 11, 2016

- References:
1. Letter, W. E. Hader, ORP, to K. A. Downing, WRPS, "Contract No. DE-AC27-08RV14800 – Clarification of Washington River Protection Solutions LLC Response to Impact Analysis Related to Stop Work Order Issued on July 11, 2016," 16-TF-0101/1603818, dated September 8, 2016.
  2. Letter, K. A. Downing, WRPS, to W. E. Hader, ORP, "Contract Number DE-AC27-08RV14800 – Washington River Protection Solutions LLC Response to the Impact Analysis Related to Stop Work Order Issued on July 11, 2016," WRPS-1602413 R2 Reissue, dated September 7, 2016.
  3. Letter, K. A. Downing, WRPS, to W. E. Hader, ORP, "Contract Number DE-AC27-08RV14800 – Washington River Protection Solutions LLC Response to the Impact Analysis Related to Stop Work Order Issued on July 11, 2016," WRPS-1602413 R2, dated August 11, 2016.
  4. Letter, W. E. Hader, ORP, to K. A. Downing, WRPS, "Contract No. DE-AC27-08RV14800 – Impact Analysis Related to Stop Work Order Issued on July 11, 2016," 16-TF-0082/1602419, dated July 25, 2016.
  5. Letter, K. A. Downing, WRPS, to W. E. Hader, ORP, "Contract Number DE-AC27-08RV14800 – Response to Stop the Work Order Issued on July 11, 2016," WRPS-1602413 R1, dated July 21, 2016.
  6. Letter, W. E. Hader, ORP, to K. A. Downing, WRPS, "Contract No. DE-AC27-08RV14800 – Stop Work Order Issued on July 11, 2016," 16-CPM-0103/1602413, dated July 12, 2016.
  7. Letter, D. E. Molnaa, HAMTC, to K. W. Smith, ORP, and M. A. Lindholm, WRPS, "Tank Farm Vapors and Worker Safety," 1602400, dated June 20, 2016.

In response to the U.S. Department of Energy (DOE), Office of River Protection (ORP) request (Reference 1), Washington River Protection Solutions LLC (WRPS) has completed an additional evaluation and is providing clarification of the impacts resulting from the Hanford Atomic Metal Trades Council (HAMTC) initiated Stop Work declaration of July 11, 2016, (Reference 7) and mandatory use of supplied air within the inside perimeter fences for the Hanford Single Shell Tank (SST) and Double Shell Tank (DST) Farms. This analysis provides additional information on previously identified impacts requested and captured in References 2 - 7, to the Tank Farms mission through fiscal year (FY) 2024, and also addresses projected impacts to meeting major DOE environmental cleanup commitments. This letter includes a schedule and cost-based discussion of deviations from the planned baseline. While the discussion is performance oriented, WRPS' priority is to worker safety and proceeding in a manner that is protective of the workers, the public, and the environment.

The enclosure with this letter includes General and Project Assumptions for Scenario Evaluation along with Consent Decree Milestone Scenarios and Impacts describing the six scenarios analyzed for the purposes of this response.

The following areas of clarification were requested by ORP (Reference 1) and are addressed below:

1. "Impacts to Base Operations and your ability to achieve the schedule necessary to timely retrieve waste from the SSTs in accordance with existing schedules and WRPS's contract. Identify any mitigation measures that could ensure that existing SST retrieval schedules will not be adversely impacted (while continuing to meet nuclear safety basis requirements)."

WRPS Response:

Schedule mitigation measures include: 1) accepting schedule risk by reducing float to achieve applicable milestones; 2) providing full funding to Tank Farms to support SCBA impacts (FY 2017 funding needs are \$78M above the President's budget of \$806M); 3) implementing chemical cartridge use in Tank Farms resulting in work efficiencies (see item #6 below).

2. "Key assumptions and specifics used in creating the *Consent Decree/TPA Milestone Impacts* table presented in Reference 2 Enclosure 3 [*sic*], in particular with respect to the Low-Activity Waste Facility Hot Commissioning dates. ORP is not able to adequately reconcile the information presented in this table without a better understanding of the underlying assumptions and priorities."

WRPS Response:

A detailed schedule analysis based on six scenarios and associated impacts to Consent Decree/Tri-Party Agreement (TPA) milestones was performed, with key assumptions noted, and is included in the Enclosure. The milestone analysis provides additional support to the WRPS initial assessment of how regulatory milestones would be affected

or delayed in each scenario, without funding constraints. Tank Farm upgrades in the AP and AW Farms are required to directly support initial Low Activity Waste (LAW) feed batches and milestone D-00A-09 *LAW Facility Hot Commissioning Complete*. These in-farm upgrades could be delayed by the use of additional respiratory protection or the implementation of new operational requirements as contemplated in each scenario.

3. "Impacts to the Tank Vapors Assessment Team (TVAT) Implementation Plan Phase 1 and Phase 2 activities resulting from the continued use of supplied air."

WRPS Response:

WRPS does not anticipate significant impact to TVAT Phase 1 and Phase 2 with funding targets of \$33M per year through FY 2019.

4. "WRPS' expectation of the schedule for completion of SST retrievals, if no additional funds are received to mitigate the impacts of increased SCBA use, according to the Hanford Atomic Metal Trades Council (HAMTC) demands and the August 31, 2016, Memorandum of Agreement between HAMTC and WRPS."

WRPS Response:

For the set of assumptions associated with the current performance baseline, the funding needed to support A/AX retrievals and meet current regulatory milestones is \$476M. The SCBA cost impact analysis with the efficiency factor of 1.77 applied to impacted field activities results in a total funding need of \$705M. The overall projected funding for Tank Farms could support the SST retrieval dates included in Reference 2, Enclosure 3, with significant enough offsets in from other work and relief on regulatory commitments (for example, work related to tank C-105 retrieval or the AY-102 Settlement Agreement). A more detailed analysis of milestone and project impacts incorporating scope prioritization direction from ORP could be completed subsequently, but would represent a different set of assumptions.

5. "Activities performed by other Hanford Contractors that are impacted by SCBA use within the tank farm boundaries (that were not included in Reference 1 [sic]) that could impact Base Operations or WRPS's ability to complete SST retrievals in accordance with existing schedules and WRPS's contract. Describe the effect on work to be performed and the projected amount of funding that WRPS believes is necessary to carry out any such activities."

WRPS Response:

An overall impact analysis to other Hanford contractors cannot be precisely performed until operational requirements are clarified.



6. "Evaluate and discuss other considerations that would give DOE a more informed view of the short term and potential long term impacts, including an update based upon the August 31, 2016, Memorandum of Agreement between HAMTC and WRPS."

WRPS Response:

At this time, WRPS does not have adequate operating experience to determine the overall impact of chemical cartridge use and the efficiency gained when compared to SCBA use within the Tank Farms. Each Farm may be very different in terms of respiratory controls and time requirements under chemical cartridge use, as specified by the job hazards. It is likely that chemical cartridge use will result in a degree of schedule efficiency and reduced operational risk as compared to the SCBA case. The schedule impacts of the chemical cartridge utilization are displayed with accompanying assumptions in the Enclosure.

The analysis provided in this letter and Enclosure captures potential impacts to Tank Farms mission through FY 2024. Consistent with the information provided in Reference 2, if mandatory use of supplied air and either a flexible or permanent 200 foot vapor control zone beyond the existing tank farm fence lines becomes an operational requirement, WRPS believes that the additional planned work above Documented Safety Analysis compliance at the Tank Farms is neither cost efficient, nor executable, or achievable with the existing Hanford site infrastructure. In addition, performing work in this manner creates additional potential safety issues that have not yet been evaluated.

Further analysis of milestone and project impacts will be performed as more information is available regarding scope prioritization direction, detailed scoping documents for upgrades supporting Low-Activity Waste feed, additional system planning refining the transfer and upgrade strategy, and any change that results from pending litigation.

Should you have any questions please feel free to contact me at 376-4592, or your staff may contact Ms. A. D. Basche at 373-6306.

Sincerely,

*(Signature Attached)*

K. A. Downing  
Contracts Manager

KAD:KJL

Enclosure:     Schedule Scenarios and SCBA Impact Analysis (4 pages)

cc: ORP Correspondence Control

R. L. Burt, ORP  
J. A. Diediker, ORP  
D. R. Garcia, ORP  
B. J. Harp, ORP  
M. J. Harrison, ORP  
J. M. Johnson, ORP  
C. J. Kemp, ORP  
D. M. MacDonald, ORP  
E. M. Mattlin, ORP  
M. T. McCusker, ORP  
S. C. Persons, ORP  
S. H. Pfaff, ORP  
K. W. Smith, ORP  
S. C. Smith, ORP  
S. D. Stubblebine, ORP  
G. D. Trenchard, ORP

WRPS Correspondence Control

A. D. Basche, WRPS  
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T. L. Farber, WRPS  
R. E. Gregory, WRPS  
M. A. Lindholm, WRPS  
J. M. Shelt, WRPS  
R. J. Sams, WRPS  
C. A. Simpson, WRPS  
B. R. Thomas, WRPS



**Electronically Approved by:**



UserName: Downing, Katie (h1668395)

Title: Contracts Manager

Date: Tuesday, 22 November 2016, 01:44 PM Pacific Time

Meaning: Signed per direction of the TOC President's Office

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## General and Project Assumptions for Scenario Evaluation

The analysis provided is based on a set of general and project assumptions supporting six key scenarios. The scenarios represent a range of potential operational outcomes stemming from current or potential future requirements associated with respiratory protection, operational controls and protocols, funding availability, and legal outcomes.

Scenarios and outcomes are subject to change as events develop and more information is available. The evaluation provided is based on preliminary assessments using parametric analysis of program level schedules and budgets. A more rigorous, technically and model-driven approach based on System Plan output may be performed to validate or adjust results.

Area	Assumption												
Base Operations/Regulatory Compliance/Infrastructure	<ul style="list-style-type: none"><li>Includes Base Operations, Infrastructure Upgrades, 222-S Ops and Modifications, DST Space Management, Integrity Program, Effluent Treatment Facility (ETF) mods/Ops, Escalation, and HQ Holdback</li></ul>												
C-105 Retrieval	<ul style="list-style-type: none"><li>No significant chance of impacts to 2024 Consent Decree milestone</li><li>C Farm retrieval scope was assumed to be completed in FY2017, but could be used as a funding source for A/AX or Waste Feed Delivery (WFD) projects</li></ul>												
AY-102 Retrieval	<ul style="list-style-type: none"><li>Funding is prioritized to meet the AY-102 Settlement Agreement requirements</li></ul>												
A/AX Retrieval	<ul style="list-style-type: none"><li>Maximize funding priority with other Tank Farm Project scope</li><li>Assumes significant ramp-up in funding between FY17 Q4 and FY18 Q1 (Total annual funding need: \$72M in FY17 → \$127.5M in FY18). Funding increases not received would result in schedule extension and/or missed regulatory milestones.</li><li>A/AX schedule float of approximately six months is still high risk to 2020 and 2024 milestones based on factors including aggressive project ramp-up</li><li>In the schedule analysis, the B-1 and B-2 milestone completions are assumed to be met through Tank Retrieval Completion Certificates (RCCs)</li></ul>												
SCBA Respiratory Protection	<ul style="list-style-type: none"><li>Schedule/Cost efficiency factor / duration &amp; resource increase of 1.77 as compared to no respiratory protection (WRPS-1602413 R2). Factor applied to impacted field activities.</li></ul> <table><tr><th></th><th>Before SCBA</th><th>After SCBA (loss of 43.9% in-field work hours)</th></tr><tr><td>Hours of Field Work a Day</td><td>5.75 hrs/day</td><td>3.25 hrs/day</td></tr><tr><td>Days Required for a 100 Hr Task</td><td><math>\left(\frac{100 \text{ hrs}}{5.75 \text{ hrs/day}}\right) = 17.4 \text{ days}</math></td><td><math>\left(\frac{100 \text{ hrs}}{3.25 \text{ hrs/day}}\right) = 30.8 \text{ days}</math></td></tr><tr><td>Cost / Duration Increase</td><td>n/a</td><td><math>\frac{30.8 \text{ days}}{17.4 \text{ days}} = 1.769 \text{ factor increase}</math></td></tr></table>		Before SCBA	After SCBA (loss of 43.9% in-field work hours)	Hours of Field Work a Day	5.75 hrs/day	3.25 hrs/day	Days Required for a 100 Hr Task	$\left(\frac{100 \text{ hrs}}{5.75 \text{ hrs/day}}\right) = 17.4 \text{ days}$	$\left(\frac{100 \text{ hrs}}{3.25 \text{ hrs/day}}\right) = 30.8 \text{ days}$	Cost / Duration Increase	n/a	$\frac{30.8 \text{ days}}{17.4 \text{ days}} = 1.769 \text{ factor increase}$
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Cost / Duration Increase	n/a	$\frac{30.8 \text{ days}}{17.4 \text{ days}} = 1.769 \text{ factor increase}$											
Waste Feed Delivery	<ul style="list-style-type: none"><li>Low Activity Waste Pretreatment System (LAWPS) design and construction are assumed to not be impacted by respiratory or other tank operations controls</li><li>Waste Feed Delivery upgrades to support LAW commissioning (upgrades in AP and AW Farms) would be impacted by the use of additional respiratory protection or implementation of new operational requirements.</li></ul>												
Chemical Cartridges Respiratory Protection	<ul style="list-style-type: none"><li>WRPS does not yet have sufficient operating experience to determine the overall impact of chemical cartridge use and the efficiency gained when compared to SCBA use within the Farms. The assumptions for chemical cartridge respiratory protection usage are:<ul style="list-style-type: none"><li>Successful 3<sup>rd</sup> party evaluation and implementation by 2/01/17</li><li>No application is anticipated for near term SSTs (e.g. C-105)</li><li>Efficiency factor / duration &amp; resource increase of 1.35 as compared to no respiratory protection. Available work hours using chemical cartridge respiratory protection were assumed at 4.25 hours per day vs. the 3.25 hours per day for SCBA efficiency factor.</li></ul></li></ul>												
200' Boundary around Tank Farms	<ul style="list-style-type: none"><li>The “re-tooling approach” delays all milestones by ~3 years</li><li>Re-tooling would be funded through deferral of work scope</li></ul>												



Area	Assumption
Waste Disturbing Activities	<ul style="list-style-type: none"> <li>Waste disturbing activities will be performed as described in scenario assumptions</li> <li>An efficiency factor/duration &amp; resource increase of 2.0 was utilized on the available hours previously associated with 24/7 schedule; driven by 168 hrs/wk (24/7 schedule) vs 112 hrs/wk (nights and weekends schedule) and reduced operating efficiency associated with working nights and weekends (i.e., substantial increase in valving and limited resources available on backshift for issue resolution.)</li> </ul>
Other	<ul style="list-style-type: none"> <li>One operations crew available for retrieval operations under cartridge/SCBA</li> <li>No additional shift to nights/weekends to accommodate construction field work</li> <li>Final court case judgment and any related mandates is consistent with current operational controls</li> <li>No significant stop works are initiated</li> <li>Does not assume any existing HAMTC demands are incorporated as project requirements or scope; no additional HAMTC demands are introduced beyond chemical cartridge Memorandum of Agreement implementation</li> <li>Transfers, evaporator campaigns, and waste feed characterization are able to be performed as planned / assumed adequate space availability</li> </ul>
Schedule Risk	<ul style="list-style-type: none"> <li>The milestone schedule provided incorporates schedule float for risk associated with each milestone critical path.</li> </ul>
6-month Continuing Resolution (CR)	<ul style="list-style-type: none"> <li>A 6-month CR is determined by DOE by January 1, 2017, allowing a 30-90 day ramp-up period with resources being available by 4/1/17</li> <li>Time phasing of ramp-up delays up to ~\$35M in spending and scope from FY2017 to FY2018 (in addition to routine carryover)</li> </ul>
12-month Continuing Resolution (CR)	<ul style="list-style-type: none"> <li>A 12-month CR would result in the deferral of \$65M in scope. Specific scope to be deferred would need to be determined consistent with available funding, the Integrated Priority List, and legal requirements at that point in time.</li> </ul>



## Milestone Scenarios

<b>Scenario 1: Baseline Case</b>  <b>(Respiratory Protection is Risk-Based and 24 hour waste disturbing activities allowed)</b>	<ul style="list-style-type: none"> <li>• Retrieval Mission: <ul style="list-style-type: none"> <li>○ Incorporate routine operational risk in forecast (retain current float)</li> <li>○ During C-Farm and AY-102 retrieval operations, Installation and Equipment Removal activities can be performed in parallel</li> <li>○ AY-102/C-105/A&amp;AX Farm are under SCBA</li> <li>○ Retrieval operations is under a 24 Hr schedule (~160hrs/week)</li> </ul> </li> <li>• Waste Feed Delivery projects (e.g. AP/AW Farm Upgrades) are completed without SCBA consistent with previous planning (Multi-Year Operating Plan Rev. 5)</li> </ul>
<b>Scenario 2: Chemical Cartridge Case</b>  <b>(Respiratory Protection is Chemical Cartridge and 24 hour waste disturbing activities allowed)</b>	<ul style="list-style-type: none"> <li>• Retrieval Mission: <ul style="list-style-type: none"> <li>○ Incorporate routine operational risk in forecast (retain current float)</li> <li>○ During C-Farm and AY-102 retrieval operations, Installation and Equipment Removal activities can be performed in parallel</li> <li>○ AY-102/C-105/A&amp;AX Farm are under chemical cartridge</li> <li>○ Retrieval operations is under a 24 Hr schedule (~160hrs/week)</li> </ul> </li> <li>• Waste Feed Delivery projects (e.g. AP/AW Farm Upgrades) completed with chemical cartridges</li> <li>• Schedule impacts associated with anticipated and routine project risks have been included in the schedules to meet key milestones</li> </ul>
<b>Scenario 3: Full SCBA Case</b>  <b>(Respiratory Protection is SCBA and 24 hour waste disturbing activities allowed)</b>	<ul style="list-style-type: none"> <li>• Retrieval Mission: <ul style="list-style-type: none"> <li>○ Incorporate routine operational risk in forecast (retain current float)</li> <li>○ During C-Farm and AY-102 retrieval operations, Installation and Equipment Removal activities can be performed in parallel</li> <li>○ AY-102/C-105/A&amp;AX Farm are under SCBA</li> <li>○ Retrieval operations is under a 24 Hr schedule (~160hrs/week)</li> </ul> </li> <li>• Waste Feed Delivery projects (e.g. AP/AW Farm Upgrades) are completed with SCBA</li> <li>• Schedule impacts associated with anticipated and routine project risks have been included in the schedules to meet key milestones</li> </ul>
<b>Scenario 4: Chemical Cartridge Case + Waste Disturbing or substantial effects to the headspace</b>  <b>(Respiratory Protection is Chemical Cartridge and waste disturbing activities are restricted to nights and weekends)</b>	<ul style="list-style-type: none"> <li>• Retrieval Mission: <ul style="list-style-type: none"> <li>○ Incorporate routine operational risk in forecast (retain current float)</li> <li>○ Assumes waste disturbing operations (including transfers and long length equipment removal) will only be run during nights and weekends (~88hrs/week)</li> <li>○ Active ventilation considered to substantially affect head space (A/AX: POR-126-127) (A: POR 518/519)</li> <li>○ C-Farm and AY-102 retrieval operations will not run in parallel while Installation and Equipment Removal activities are being performed</li> <li>○ AY-102/C-105/A&amp;AX Farm are under chemical cartridge</li> </ul> </li> <li>• WFD projects (e.g. AP/AW Farm Upgrades) completed with chemical cartridges</li> </ul>
<b>Scenario 5: Full SCBA Case + Waste Disturbing or substantial effects to the headspace</b>  <b>(Respiratory Protection is SCBA and waste disturbing activities are restricted to nights and weekends)</b>	<ul style="list-style-type: none"> <li>• Retrieval Mission: <ul style="list-style-type: none"> <li>○ Incorporate routine operational risk in forecast (retain current float)</li> <li>○ Assumes waste disturbing operations (including transfers and long length equipment removal) will only be run during nights and weekends (~88hrs/week)</li> <li>○ Active ventilation considered to substantially affect head space (A/AX: POR-126-127) (A: POR 518/519)</li> <li>○ C-Farm and AY-102 retrieval operations will run not in parallel while Installation and Equipment Removal activities are being performed</li> <li>○ AY-102/C-105/A&amp;AX Farm are under SCBA</li> </ul> </li> <li>• Waste Feed Delivery projects (e.g. AP/AW Farm Upgrades) are completed with SCBA</li> </ul>
<b>Scenario 6: 200 Ft VCZ</b>	<ul style="list-style-type: none"> <li>• 3 year re-tooling impact to schedule</li> </ul>

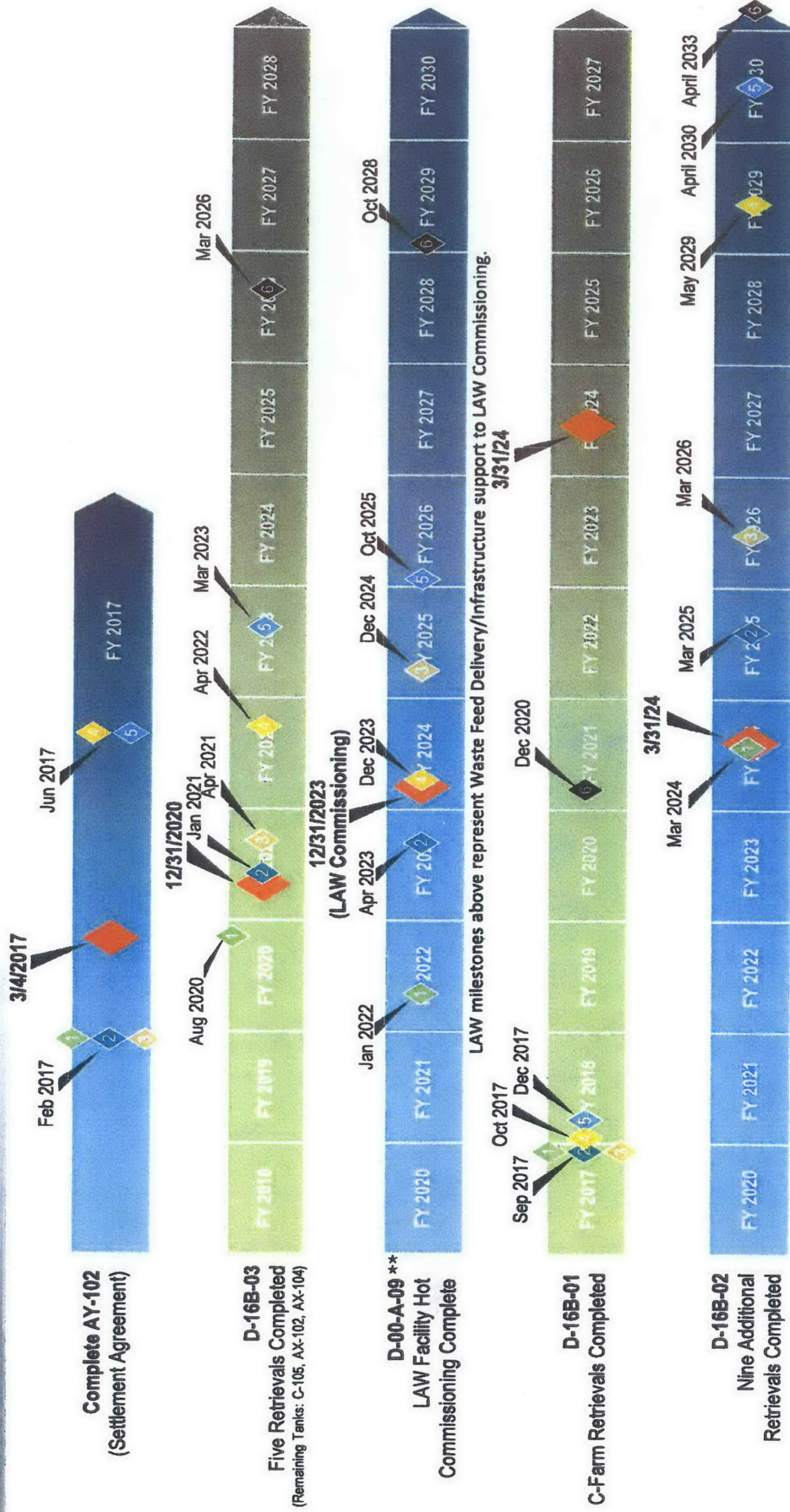
\*color coding reflects milestone designation in Milestone Impacts Timeline





# Milestone Impacts

Washington River  
Protection Solutions



Note: Milestone analysis assumes adequate funding to meet dates shown.

\* Includes substantial effects to tank headspace and results in waste disturbing work performed on weeknights/weekends rather than 24-7 operations.  
\*\* These dates may be able to be pulled forward to an extent through adjustment of priorities.